DOCUMENT RESUME

ED 055 669 PS 005 156

AUTHOR Cramer, Ellen K., Comp.
TITLE An Annotated Bibliography of Books and Articles on Pre-School Math Materials.
INSTITUTION George Washington Univ., Washington, D.C. Special Education Instructional Materials Center.
PUB DATE 4 Oct 71
NOTE 7p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Annotated Bibliographies; Books; Curriculum Guides; *Mathematics Instruction; *Mathematics Materials; Periodicals; *Preschool Education

ABSTRACT

This bibliography, pertinent to preschool math materials, contains math materials, contains references which are largely devoted to descriptions of materials and to an explanation of their use. The content of each reference has been described briefly and notation has been made concerning inclusion of plates which would picture the material or even show it in use. Also included in the bibliography are some math curriculum guides which may be of interest to teachers. This bibliography is by no means exhaustive, but it does acquaint the reader with several of the materials from structured math systems which are available, but not generally in use.
(Author)

ED055669

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

An Annotated Bibliography of Books and Articles on Pre-School Math Materials

by Ellen K. Cramer
Research Associate
MAR-SEIMC
George Washington University
Washington, D. C. 20006

PS005156

This bibliography, pertinent to pre-school math materials, contains references which are largely devoted to descriptions of materials and to an explanation of their use. The content of each reference has been described briefly and notation has been made concerning inclusion of plates which would picture the material or even show it in use. Included in the bibliography also are some math curriculum guides which may be of interest to teachers

This bibliography is by no means exhaustive, but it does acquaint the reader with several of the materials from structured math systems which are available, but not generally in use. Several of the materials analyzed by the committee are taken from these systems.

Andrews, E. E. and Nelson, L. D. Abstract concept of number. Arithmetic Teacher, 1963, 10, 330-333.

The article emphasizes the necessity to teach the abstract concept of number rather than computation per se. Included is a discussion of the advantage and disadvantages of using structured materials such as Cuisenaire rods and Stern blocks.

Bernstein, A. L. Use of manipulative devices in teaching mathematics. Arithmetic Teacher, 1963, 10, 5.

The author sets down 7 principles regarding the use of manipulative devices to teach mathematics. Reference is made to specific manipulative and pictorial materials.

Clarke, G. W. The Stern apparatus in the infant school. New Era, 1959, 129-131.

This article describes the Stern Number Apparatus and contains pictures of children using the material.

Clarkson, J. Using Cuisenaire with infants. New Era, 1959, 131-134.

This article contains a description of the materials, the purpose of the materials, the difficulties encountered by the author in using the materials and favorable qualities of the Cuisenaire rods. Article includes plates of children using materials. Also pictures comparing Cuisenaire materials with the Stern materials.

Churchill, E. M. Counting and measuring. London: Routledge and Kegan Paul, 1961.

The book explores the aims and content of number education in the pre-school. The nature of number concepts and the language of number are discussed by the author who also gives suggestions of the kinds of opportunities which contribute to the development of number concepts. Ch. 6, "From the Concrete to the Abstract," specifically deals with the role of materials. Dienes, Cuisenaire and Stern materials are analyzed and compared. Included also are pictures of children using materials as well as suggested materials for classrooms in a pre-school.

Cuisenaire, G. and Gattegno, C. Numbers in colour. London: Heinemann Educational Books Ltd., 1963.

The book describes the Cuisenaire rods and the uses to which the material can be put in classroom situations at the pre-school, elementary and secondary level.

Dienes, Z. P. Mathematics in the primary school. London: Macmillan and Co., Ltd., 1966.

A logical and mathematics analysis of some of the material that could be studied at the primary school level. Also an examination of the psychological as well as the social implication of the process of learning mathematics. It contains pictures of the materials in use.

Dienes, Z. P. Mathematics for primary education. Hamburg, Germany: UNESCO Institute for Education, 1966.

An examination of the theoretical problems of learning mathematics and description of some of the practical applications of the fundamental researches into the problems of mathematics learning in early schooling.

Dienes, Z. P. and Golding, E. W. Learning logic, logical games. Pinnacles, Harlow, Essex: The Educational Supply Association, Ltd., 1966.

This book is concerned with the learning of logic by young children. It contains numerous lessons and games leading to an understanding of logic. Plates of children using the materials included.

Dienes, Z. P. and Golding, E. W. Modern mathematics for young children. New York: Herder and Herder, 1966.

The book is concerned with the foundations of number concepts. Through the use of his own materials, he describes a series of experiences which will integrate the learning of logical, set and number concepts into an organic whole.

Gattegno, C. For the teaching of elementary mathematics. (Vol. 3) Mt. Vernon, New York: Cuisenaire Company of America, Inc., 1964.

The book contains articles which outline the development of the Cuisenaire-Gattegno approach to elementary mathematics education. A description of the rods, the psychology behind their development and an explanation of their use is included.

Gattegno, C. Mathematics with numbers in color. (Book A) Mt. Vernon, New York: Cuisenaire Company of America, Inc., 1966.

Book A is the first of a series which are designed to be used with the Cuisenaire rods. It explains how to use the rods at the lowest levels.

Karatzinas, D. and Renshaw, T. Teachers' views of the Cuisenaire method. The Scottish Educational Journal, 1958, Sept. 19, 575, Sept. 26, 595, Oct. 3, 613.

A series of three articles containing a survey and its results concerning the use of the Cuisenaire material by teachers who were familiar with it. Fundamental questions concerning its use are covered. These articles might be seen as a valuable guide in using the material.

Montessori, M. M. Maria Montessori's contribution to the cultivation of the mathematical mind. International Review of Education, 1961, 7, 2, 134-141.

The article contains a brief explanation of the Montessori philosophy and the place of mathematics in the general education of the child. It describes also the Montessori materials used to teach mathematical concepts.

Orem, R. C. (Ed.) A Montessori handbook. New York: G. P. Putnam's Sons, 1965.

An explanation of the Montessori approach to education. Chapter 4, "Intellectual Education," includes a section on Arithmetic in which the Montessori math materials are described.

Shaw, H. The development of the child's conception of number. Educational Review, 1961, 13, 3, 184-198.

The article contains a review of Piaget's number concepts and a description of the author's own structured math materials--"The Structa' Apparatus" which applies Piaget's findings to the teaching of number.

Stern, C. Children discover arithmetic. New York: Harper, 1949.

The book contains a detailed explanation of an approach to structural arithmetic. The child learns by working with sequenced materials developed by the author. She defines the basic concepts involved in each mathematical task, gives actual teaching procedures, and summarizes the child's accomplishments in terms of concepts and skills acquired. Plates showing children using the materials are included as well as diagrams of materials.

Stern, C. Mastery in mathematics. Teaching Arithmetic, 1965, 3, 1, 24-32.

This article contains an explanation of Structural Arithmetic and the use of the Stern Apparatus. Pictures and diagrams are included.

Williams, J. D. Teaching artihmetic by concrete analogy--4 parts. Educational Research, 1961, 3, 2 & 3; 1962, 4, 3; 1963, 5, 2.

A presentation of the main features of the structural systems now being used to teach arithmetic. The author takes each mathematical task and shows how it is handled by the various structured materials. Included in the analysis are Unifix, Stern, Dienes, Montessori, Cuisenaire, Lowenfield, Shaw and Bass materials. Articles contain detailed descriptions and many diagrams comparing systems.

MATH CURRICULUM GUIDES

Bureau of Curriculum Development. Mathematics: pre-kindergarten, kindergarten, and grade one, part one. Brooklyn, N. Y.: New York City Board of Education, 1966.

This bulletin, part of a developing curriculum program, incorporated the pre-kindergarten into the educational system and reorganizes math materials in the early childhood years. Part one deals mainly with sets and subsets, numbers in sets and number names

Glennon, V. J. Arithmetic and curriculum organization. Series of Monographs on the Teaching of Arithmetic. Syracuse: Orange Publishing Co., 1954, No. 3.

A curriculum for elementary school.

Greater Cleveland Mathematics Program. Scope and Sequence K-6. U.S.A.: Educational Research Council of America, 1968.

The kindergarten section centers on the development of pre-number ideas and concepts on which mathematical understandings are built. Teacher's guide included.

Minnemath Curriculum Materials. Minneapolis, Minn.: University of Minnesota Press, 1963.

Mathematics units developed for K-3.

Rosenbloom, P. Materials of the Minnesota school mathematics projects. Minneapolis, Minn.: University of Minnesota Press.

These materials contain stories and exercises for the development of the ideas of sets and the operations on sets, and the foundation of number concepts on these and on geometrical experiences.

Suppes, P. Sets and numbers. New York: L. W. Singer Co.

Carefully graded exercises on the formation of the set concept, operations on sets and the generation of the number concepts, basing itself on cardinality as fundamental.

PS 005156

EKC:mas
10/04/71